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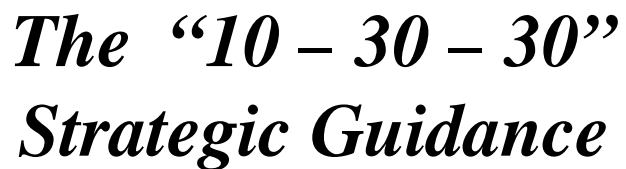
Sea Basing

Presentation to
The Honorable John J. Young, Jr.
ASN (RD&A)
5 August 2004

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Outline

- Sea Base Operational Scenario
- Terms of Reference
- Takeaways
- Study Approach
- Observations
- Critical Obstacles
- Solution Concepts
- Conclusions and Recommendations



“To have Options, Maneuverability and Sanctuary”



Study Terms of Reference

To close a Marine Expeditionary Brigade ...

CONUS → Sea Base → Shore Objective

1) Identify and analyze:

- High-speed / high-capacity connectors

- *CONUS / Advance Base to Sea Base*

- *Sea Base to shore objectives*

- Connector-to-platform interfaces for operations through Sea State 4

2) Recommend:

- Near-term and long-term technology developments to achieve desired capability₄



Study Panel and Sponsor

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Study Sponsor : OPNAV N75 MajGen J.R. Battaglini

“What are the critical impacts on MPF(F) design?”

Takeaways

- End-to-end material transport—critical core function
 - *High throughput and reliability*
 - *Standardized containers*
- High-speed surface connector—critical enabler
 - *HSC/LCAC synergies*
 - *Extended standoff*
 - *Reduced fuel consumption*
 - *Multi-use*
- MPF(F)—new connector interface functions
 - *High speed load/unload*
 - *Automated warehousing*
- Implement an MPF(F) Spiral 0 program
 - *Modified S-class container ship*
 - *System integration and at-sea demonstration*
 - *Current assets plus new technology*

End-to-end systems engineering required

Study Approach

- Draw from stakeholders and guidance
- Frame the connector problem
 - *Critical functions*
 - *Modeling and simulation (MCCDC)*
 - *Obstacles*
- Review technology and practice
- Develop solutions

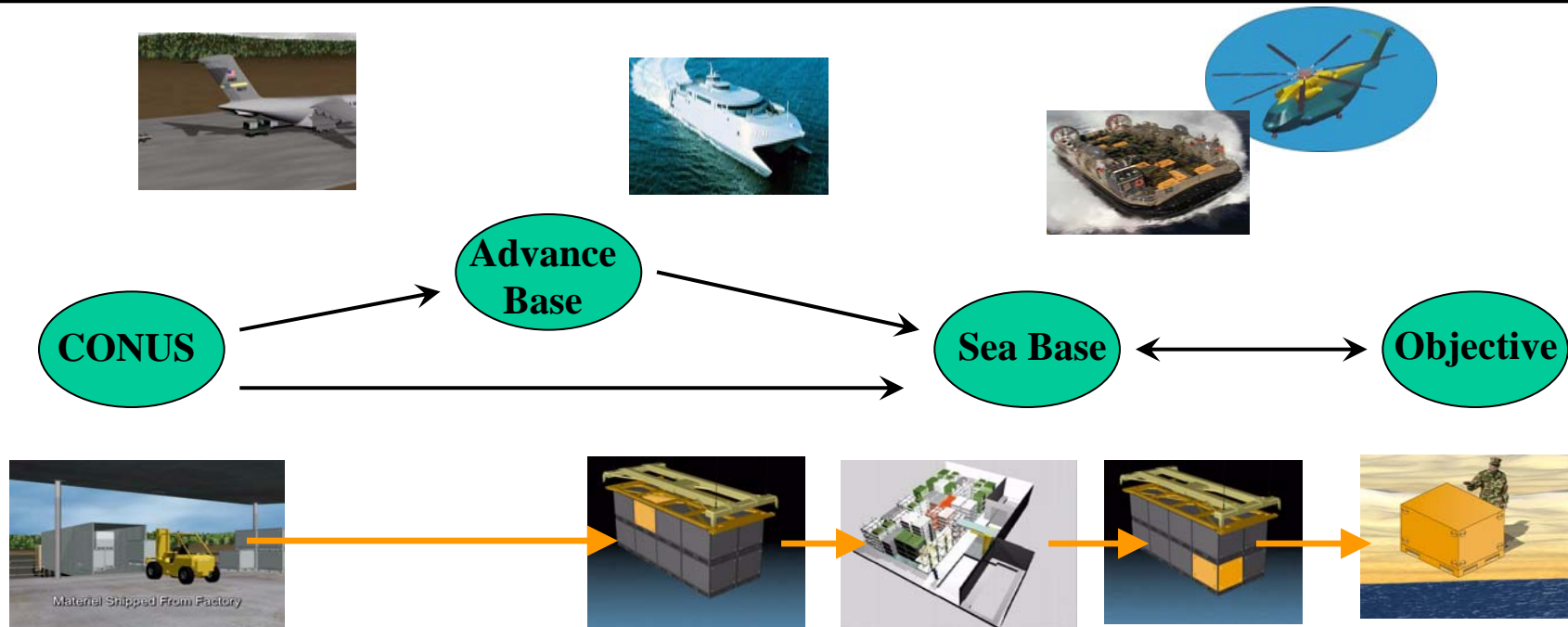
***Assumptions: Sea Shield provides force protection
FORCEnet provides communications***

Briefings and Visits

- OPNAV: N75, N42
- Marine Corps: HQMC, MCCDC
- ONR: CNR, EXLOG FNC
- Fleet Visits: FFC, Ship tours
- System Commands: PMS 325, NAVSEA 05D, NAVAIR
- Other Government: CNA, Army, DARPA
- Industry: Bell/Textron, Sikorsky, Maersk, Lockheed, UMOE, FEDEX, Navatek



What Critical Function Drives Connector Requirements?



End-to-end, high throughput material transport and handling

Observations

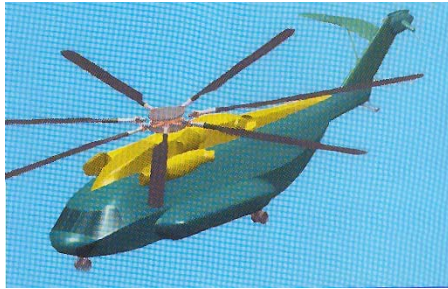
- CONOPS drives solutions
 - *100 nm standoff*
 - *8 hr insertion*
 - *Sea State 4*
- Modeling and simulation identify sensitivities
 - *Air insertion: limited to 135 -150 nm*
 - *Surface insertion: impossible in 8 hrs, limited to 50 nm*
 - *Airlift sustainment: limited to 135-150 nm*
- Connector loading problematic (ILP)
- Packaging not standardized
- Medical requirements not addressed

Critical Obstacles

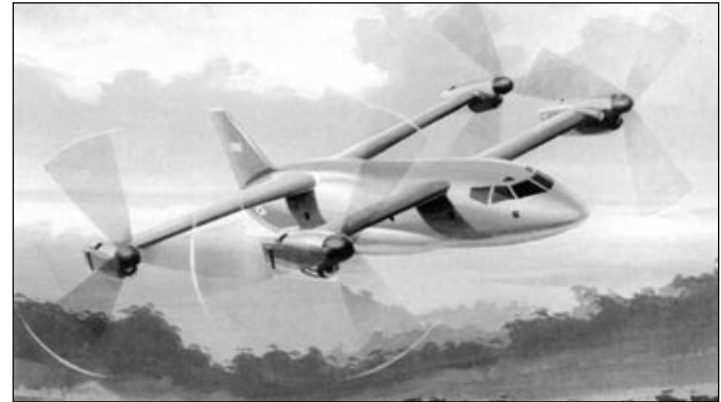
- Air connectors
 - *Operational Range*
 - *Heavy lift to/from Sea Base*
- Surface connectors
 - *Sea State 4 transfers*
 - *LCAC fuel consumption*
 - *Unimproved shore*
- MPF(F) functions
 - *Fast load/unload*
 - *Material breakout*
 - *Automated warehousing*



Overcoming Air Connector Obstacles



- Long-range heavy lift to/from Sea Base unavailable
 - *CH-53X will help—deployment a problem*
 - *Range/Speed enhancements are most important*
 - *Other options are long-term - -i.e. Joint Heavy Lift*

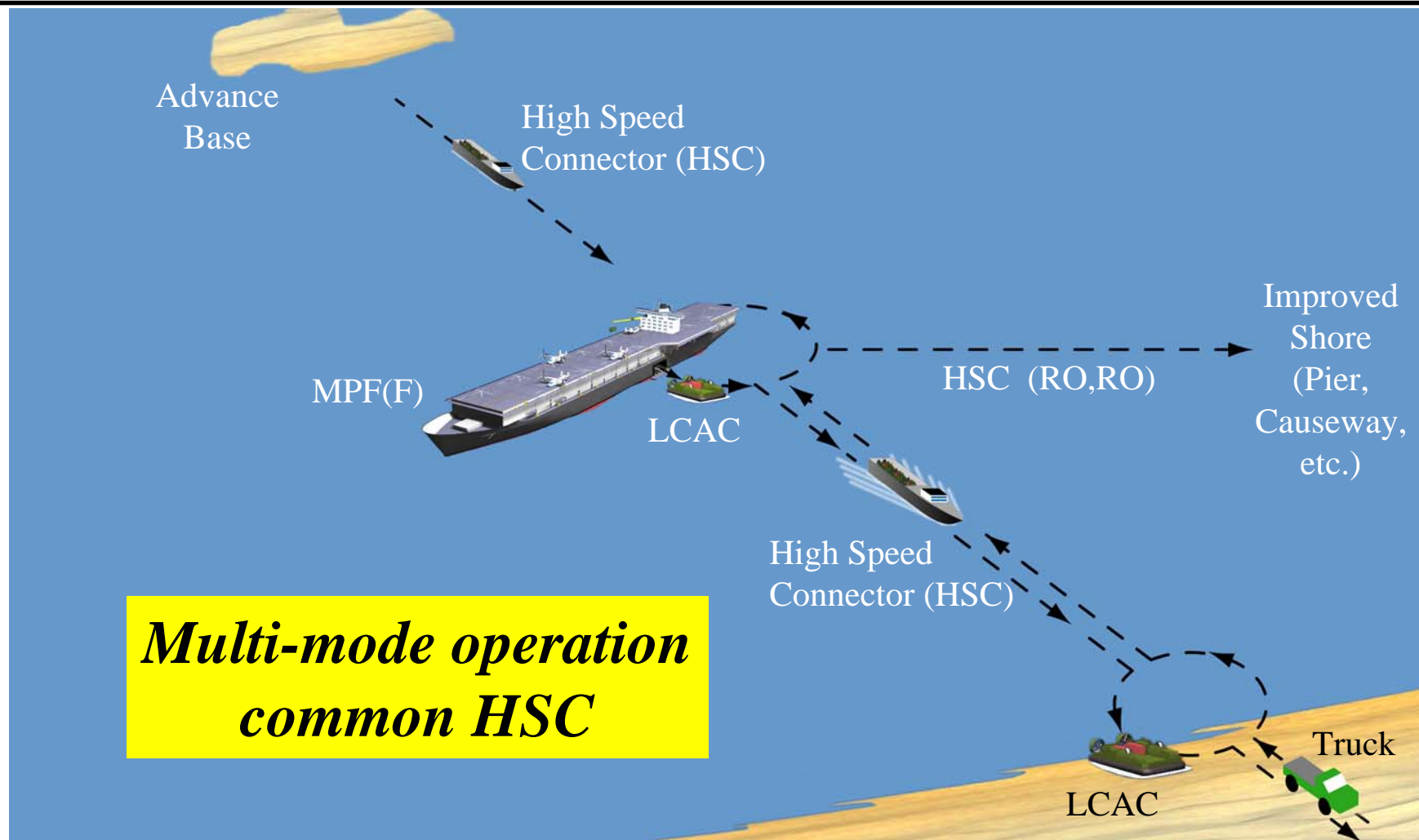




Overcoming Surface Connector Obstacles

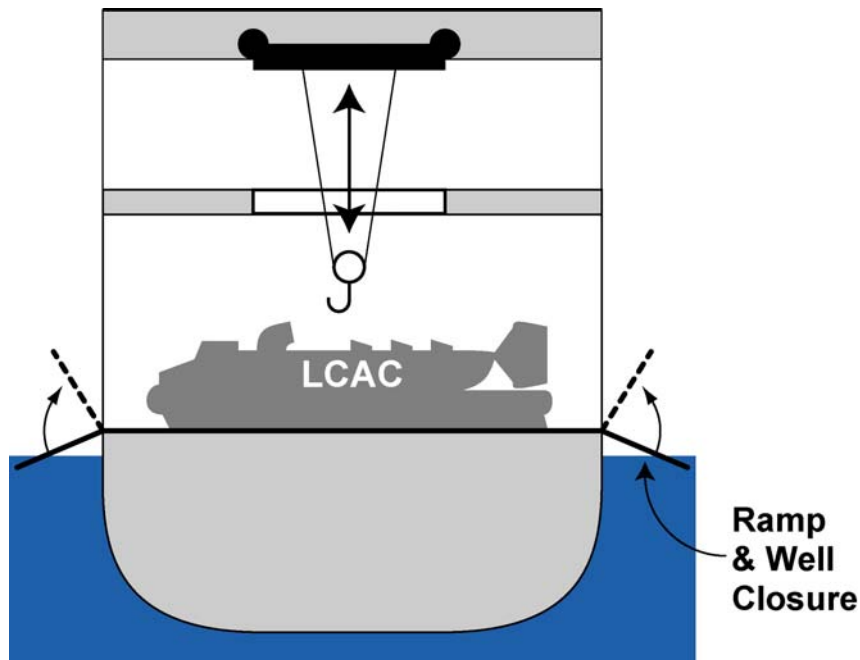
- Transfer rate in Sea State 4
 - *Eliminate relative motion*
 - *Load big—unload small*
 - *LCAC shuttle from MPF(F) to HSC*
- LCAC fuel consumption
 - *Use HSC as LCAC truck*
- Unimproved shore
 - *Deliver materiel over-the-beach*
 - *Use LCAC as pallet truck*

Operational Concept

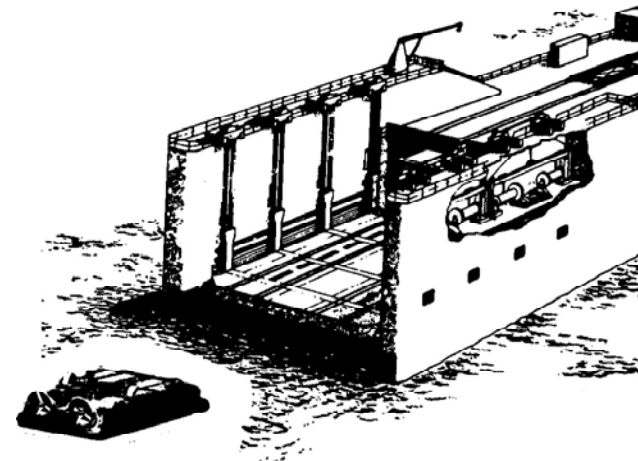


High-rate LCAC Loading Enabler #1

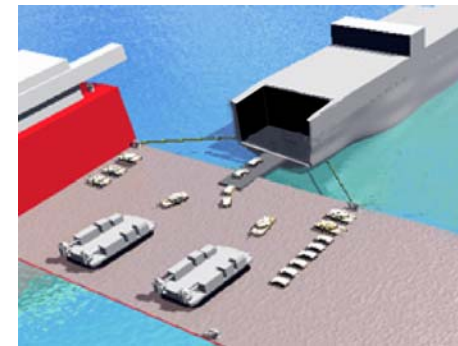
Transverse Tunnel (Drywell)



Stern Elevator



Intermediate
Transfer Platform



High Speed Connector Enabler #2

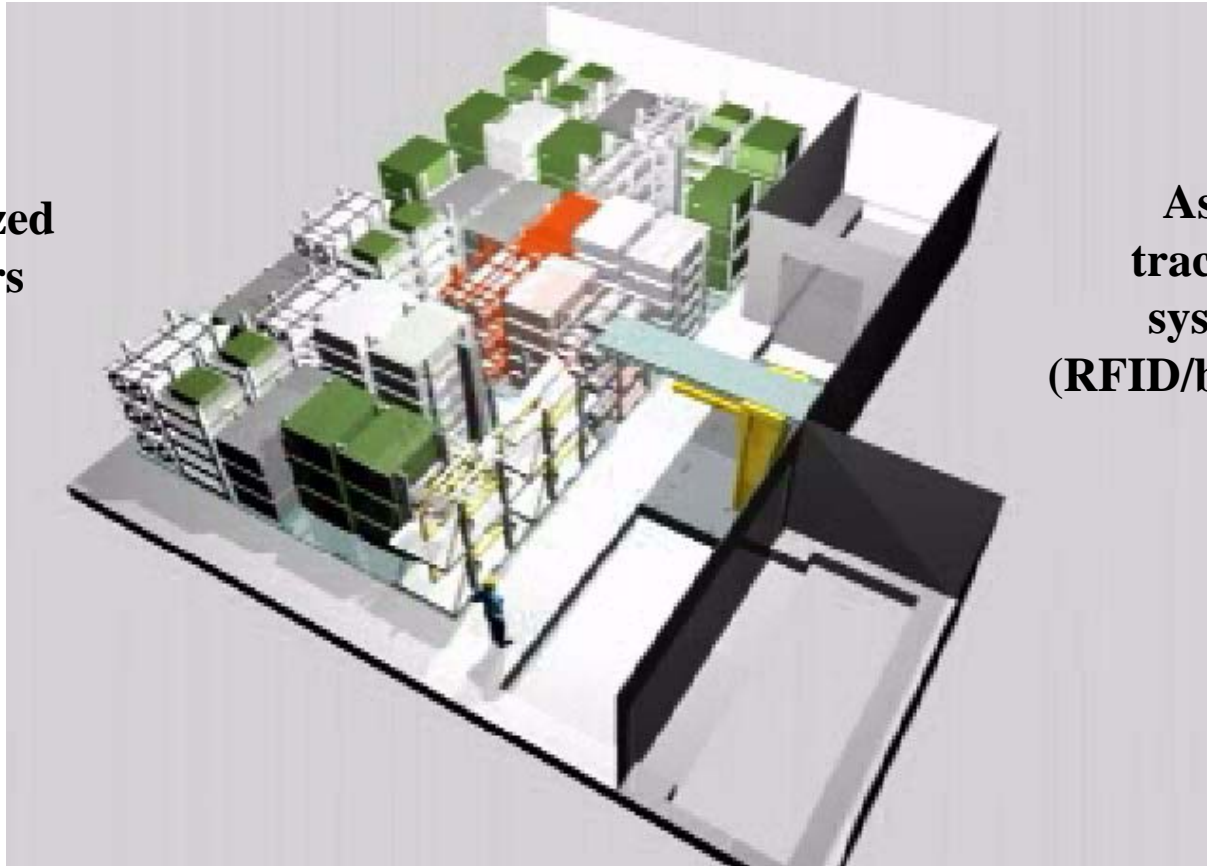
Threshold capabilities:

- *> 30 kts, 2000 nm loaded*
- *3 loaded LCACs + additional cargo/troops*
- *Rapid LCAC launch and recovery*
- *Three loading modes*
 - LCAC
 - Vertical
 - RO/RO



Shipboard Automated Warehouse Enabler #3

**Standardized
containers**



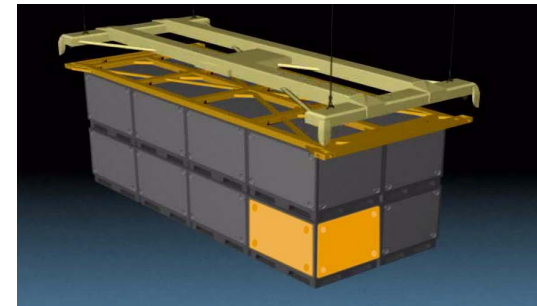
**Asset
tracking
system
(RFID/bar code)**

Need time to integrate best commercial practices

Benefits of Candidate Solution

- Standoff range increased
- LCAC advantages retained
- HSC serves multiple purposes
- Rapid loading
 - *LCAC on MPF(F)*
 - *HSC via LCACs*
- Modular container breakout
 - *Large for loading efficiency*
 - *Small for beach movement*
 - *No TEUs on shore*

LCAC offers over-the-beach capability



16 JMIC containers
equal 1 TEU

No technical breakthroughs needed



Overcoming MPF(F) Platform Obstacles

- Spiral 0 system integration and sea-trial program
 - *Commercial platform*
 - *Joint with JFCOM and TRANSCOM*
- High Rate LCAC loading in Sea State 4
 - *Demonstrate promising designs*
- Automated warehousing
 - *Demonstrate JMIC compatibility*
 - *Apply best commercial technology*
 - *Develop and test shipboard handling system*

MPF(F) Vision Unclear

- All-purpose ship versus family of ships
- Command and control
- Manning (civilian, Navy, Marine)
- Maintenance/repair capability
- Troop accommodations
- Medical facilities
- Reconstitution requirements
 - *Retrograde*
 - *Personnel*
 - *Equipment/supplies/vehicles*
- Connector deployment

***Too many
unknowns;
not ready to
build***



MPF(F) Spiral Development— New Initiatives

- Near term (12 to 18 months)
 - *S-Class container ship conversion*
 - LCAC transverse tunnel interface
 - Flight deck and hangar
 - Automated warehousing
 - *SeaBee stern elevator/LCAC interface demo*
 - *Intermediate transfer platform demo*
- Mid-Term (18 to 36 months)
 - *Initiate MPF(F) shipbuilding program*

Cost effective and timely investment

Maersk S-Class Conversion Concept

*With flight deck,
elevators, hangar, and
transverse tunnel*



- Two Flight deck elevators
- Deck spots for 15 V-22 equivalents
- Hangar stowage for 72 H-46 Equivalents
- Hangar environmentally controlled for Army SOF aircraft

Why an S-Class Conversion?

- Commercially operational
- Preliminary conversion design done for DoD
- Sea test in 12 to 18 months
- Provides deck spots and hangar
- Demonstrates critical MPF(F) enablers
 - *Automated warehousing*
 - *Rapid LCAC loading*
- Affordable

Deployable for near-term strategic missions

Summary of Conclusions

- Material Handling
 - *JMIC essential for throughput*
 - *Automated warehousing*
 - *LCACs as pallet-trucks/lighters*
- Connectors
 - *HSC efforts lack system focus*
 - *HSC and LCAC synergy possible*
 - *HSC needs multiple loading options*
 - *Fuel consumption limits operations*
 - *Heavy cargo is a problem*
 - *Airlift options limited*

Summary of Conclusions (continued)

- MPF(F) Ships
 - *Current interface concepts inadequate*
 - *Automated warehousing critical*
 - *Need:*
 - Total Sea Base systems engineering
 - Refined CONOPs and requirements
 - Connector interface system
 - Logistics C2 system
 - At-sea demonstrations

Recommendations

- Mandate standardized JMIC container program
- Develop HSC prototype to exploit synergies with LCAC
- Pursue S-class conversion as MPF(F) Spiral 0 capability
- Conduct MPF(F) defining demonstrations
 - *Automated material handling system*
 - *Transverse LCAC loading tunnel*
 - *SeaBee-type stern elevator LCAC loading*
 - *FLO/FLO LCAC loading/cargo transfer*
- Maintain CH-53X funding
- Support the Joint Heavy Lift Task Force

Recommendations (continued)

- S&T Investment
 - *Pursue aggressive EXLOG FNC Program*
 - *Develop innovative HSC hull and propulsion technology*
 - *Invest in advanced air-cushion technology*
 - *Focus ONR Innovative Naval Prototyping on MPF(F)/HSC Spiral 0 initiative*

Sea Basing

Takeaways

- End-to-end material transport—critical core function
- High speed surface connector—critical enabler
- MPF(F) facilitating functions—critical demos
- MPF(F) Spiral 0 program